United States
Environmental Protection
Agency

Solid Waste and
Emergency Response
(55026)

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EPA

Superfund At Work

Hazardous Waste Cleanup Efforts Nationwide

Northwest Transformer Mission/Pole Site Profile

Site Description:
Former electrical transformer salvage yard

Site Size: 1.2 acres

Primary Contaminants:
Polychlorinated biphenyls (PCBs)

Potential Range of Health Risks:
Chloracne, topical irritations, central nervous system disorders, and increased risk of cancer

Nearby Population:
200 people within a one-mile radius

Ecological Concerns:
Local agriculture and wildlife

Year Listed on the NPL: 1986

EPA Region: 10

State: Washington

Congressional District: 2

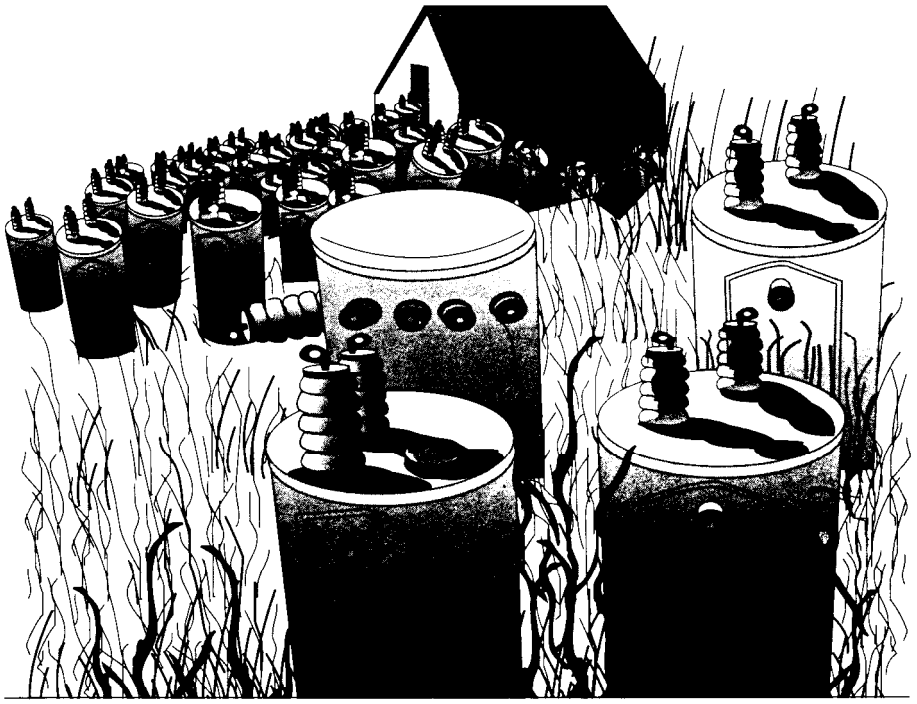
Success in Brief

Electrical Transformers Removed From Farming Community

A high degree of cooperation among federal, state, and private parties characterized the cleanup of the Northwest Transformer Mission/ Pole (NWTMP) site in Whatcom County, Washington. Almost 30 years in the making, this old salvage yard had been thoroughly contaminated with polychlorinated biphenyls (PCBs). Hundreds of electrical transformers and capacitors littered the site, some with dangerously high PCB concentrations. Adhering to the stricter standards of the state, the U.S. Environmental Protection Agency (EPA) developed a Superfund cleanup strategy that included:

- An emergency removal of PCB-contaminated soil, liquids and transformers;
- An amended soil cleanup plan that met requirements of the state's Model Toxics Control Act;
- Negotiated settlements with site operators, utility companies, and small-volume generators to conduct a $3.7 million cleanup; and
- Cost recovery of 90% of past cleanup and future monitoring costs.

Joint efforts succeeded in restoring soil and protecting drinking water for future generations. This site will be available for future redevelopment without restrictions once ground water monitoring is completed.

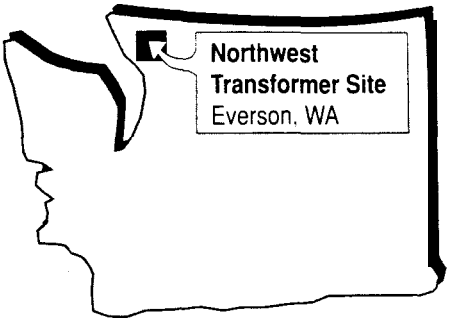


Hundreds of leaking transformers surrounded the wooden salvage barn.

The Site Today

All the transformers and hazardous liquids are gone. Disturbed portions of the site have been backfilled and covered with six inches of topsoil and grass. Ground water monitoring will continue through the spring of 1995 to ensure that off-site and perimeter wells remain uncontaminated.

A Site Snapshot

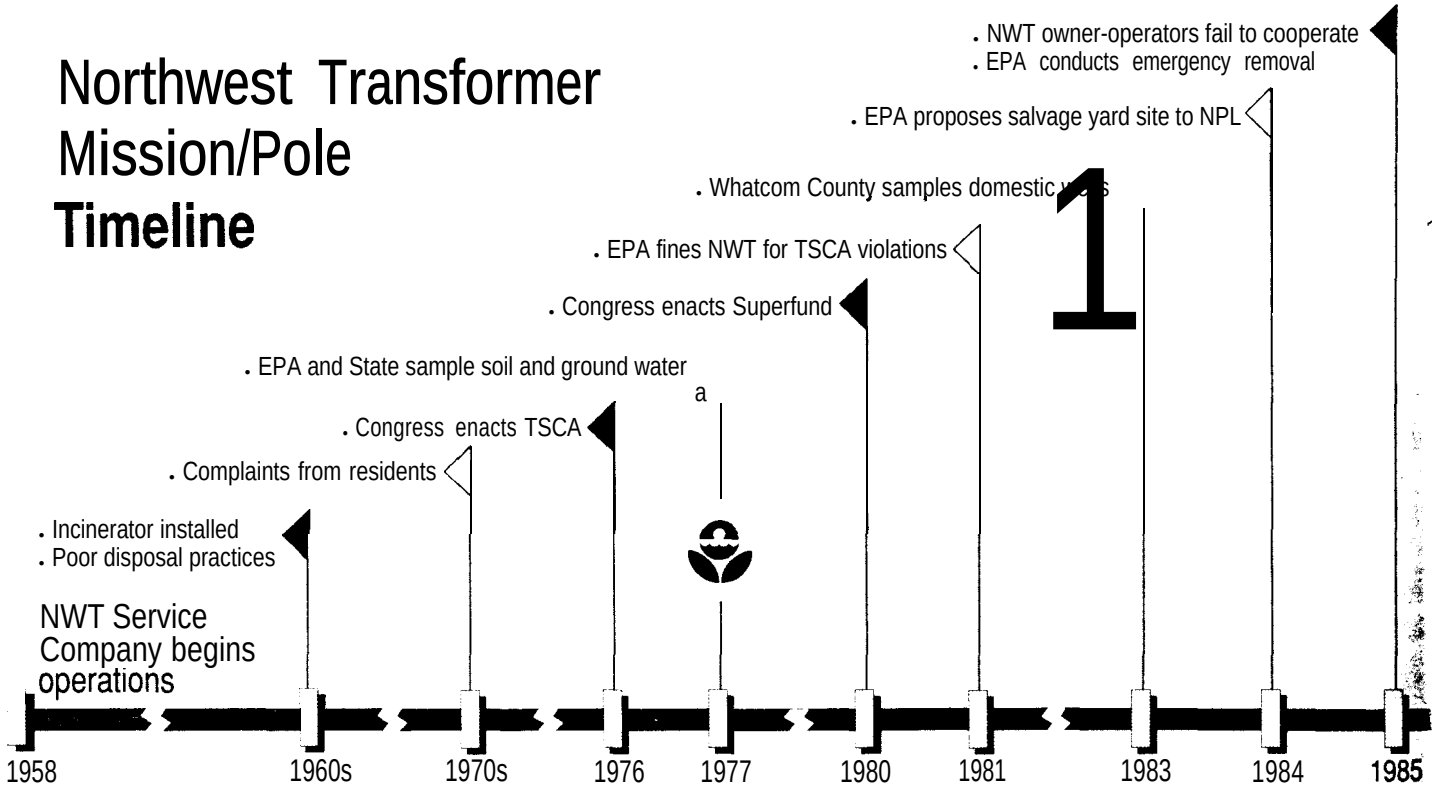


This 1.2 acre site is at the intersection of Mission and Pole Roads, two miles southwest of Everson, Washington. One of two properties opera ted by the Northwest Transformer Service Company, the NWTMP site served as a former salvage and storage area for electrical transformers. The site is less than 10 miles from the Canadian border and adjoins prime agricultural land, dairies, and commercial and family farms to the south. The rest of the area is residential with approximately 200 people living within one mile of the site. Ground water is used for agricultural irrigation and is a source of residential drinking water. Some 27 private wells are located within a half mile of the site.

The NWT Service Company operated from 1958 to 1985 at a one-acre site in downtown Everson (South Harkness Street). The company repaired, stored, and rebuilt electrical transformers and capacitors containing polychlorinated biphenyls (PCBs). The Mission/ Pole Road salvage yard was leased for disassembling the transformers and capacitors, draining fluids, and reusing parts. When the plant downtown closed in 1987, the company employed a dozen people and was receiving transformers from more than 80 different utility companies.

When first investigating the salvage yard, EPA discovered about 500 transformers abandoned in an open field. Waste oil and PCBs were found in a seepage pit and a wooden barn; much of the soil was thoroughly saturated. With both agricultural and residential properties nearby, the potential for exposure to contaminants was high. PCBs can be highly toxic and are associated with a wide range of topical irritations, central nervous system disorders, and a variety of cancers.

Northwest Transformer Mission/Pole **Timeline**



Cooperative Efforts Transform Hazardous Waste Site

Public Awareness Triggers Response

Starting in the early 1960s, workers at the salvage yard drained contaminated fluids from spent transformers into a wood-frame, gravel-filled seepage pit about six to eight feet deep. Workers also used some PCB oils to heat a wooden barn that served as a work area, salvaging scrap copper and steel for sale to local firms. Some PCB wastes and casings from transformers were burned in an open concrete pit called an air curtain incinerator. The incinerator only operated about twice a year, reaching temperatures up to 1,200" F.

During the 1970s, Everson residents complained to state and local officials about the unrestricted site, noting that children may have come into direct contact with tainted soil. State officials were unaware of any health effects related to the biannual incinerations.

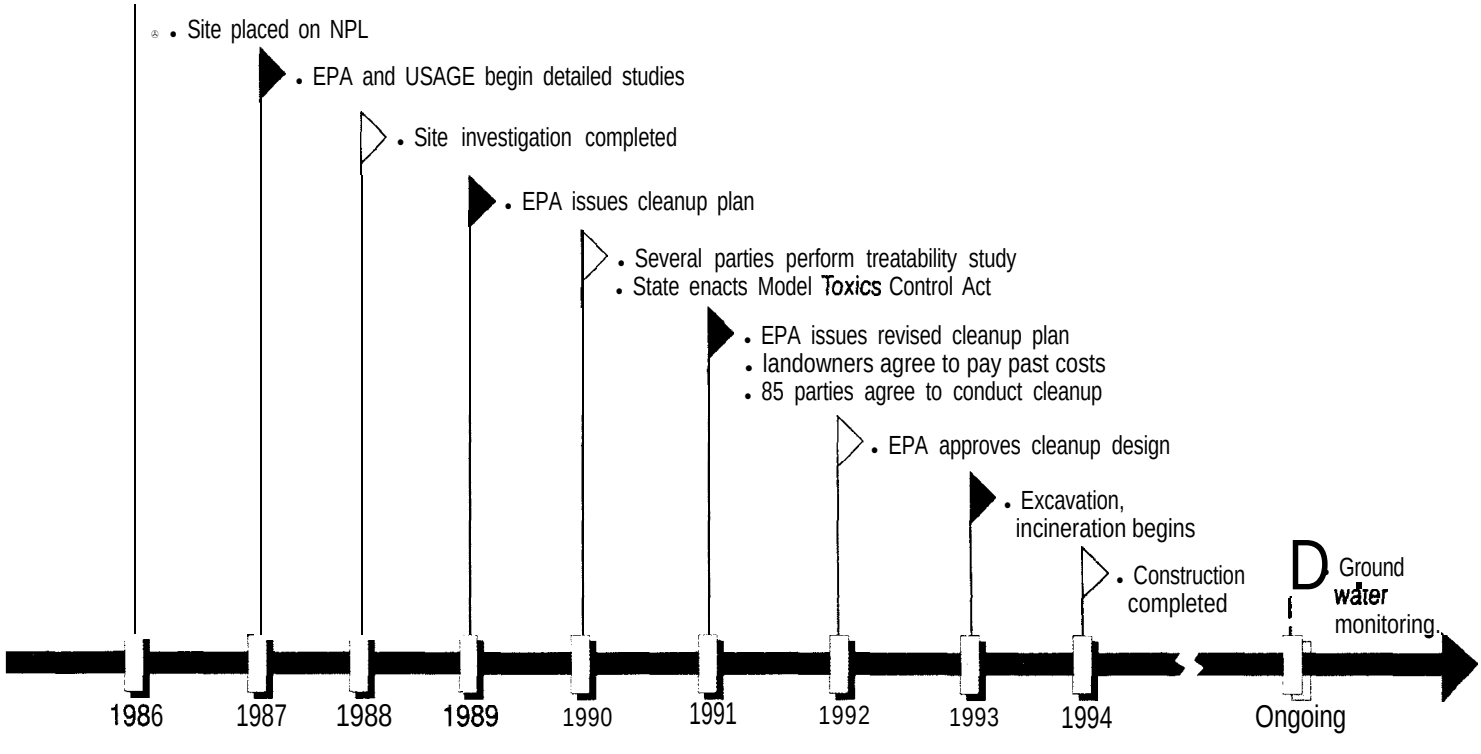
Hundreds of transformers littered the site

In 1976, Congress enacted the Toxic Substances Control Act (TSCA) which outlawed PCB production and distibution. Beginning in 1977, new EPA regulations required the Washington State Department of Ecology and Whatcom County officials to regularly inspect the NWTMP site.

Finding the site "in a condition of disarray", EPA fined NWT's owners and operators under TSCA for improper storage and disposal of PCBs and for inadequate record keeping, marking, and dating. Six months earlier in December 1980, Congress had enacted the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This law established the "Superfund" program to clean up the multitude of problems associated with improper hazardous waste disposal.

Dangerously High PCB Levels Revealed

At this time, ground water samples from nearby domestic wells indicated no elevated levels of PCBs in local drinking water.



But 200 parts per million (ppm) were recorded in on-site soil, 20 times higher than federal safety standards. EPA proposed the site to the National Priorities List, the agency's roster of serious hazardous waste sites requiring cleanup under the Superfund program. In March 1985, EPA again sampled soil and liquids at the site and recorded PCB levels as high as 38,000 ppm. This severe contamination prompted EPA to order the company to restrict access to the site, start cleaning up the soil, and take samples.

EPA Stabilizes Site

When NWT Service Company failed to comply with the cleanup order, EPA enclosed the salvage yard with an eight-foot cyclone fence. All the transformers were centralized and rinsed of their PCB fluids and about 6,000 gallons of tainted liquids were incinerated or recycled. A technical assistance team excavated and disposed of 1,400 cubic yards of contaminated soil and debris at approved facilities. Workers also installed five ground water monitoring wells and tested 21 residential wells; no private well had elevated PCB levels.

EPA Selects Comprehensive Cleanup Plan

While the 1985 emergency action reduced some dangers, the site required a comprehensive remediation. In 1986, EPA placed the site on the NPL, and together with the U.S. Army Corps of Engineers, conducted in-depth studies between 1987 and 1988.

These studies found certain areas to be contaminated with PCBs at markedly elevated levels. In addition, the wooden barn was a source of residual contamination and low levels of PCBs in ground water warranted continued monitoring.

EPA's final cleanup plan, announced in 1989, featured an innovative technology known as in situ vitrification (ISV). ISV is a thermochemical treatment process that electrically melts the contaminants in soil. Upon cooling, a stable, glass-like solid remains. EPA's recommendation was to cap the treated soil with a two-foot soil cover and to continue studies of area ground water and the barn to determine if additional cleanup actions were necessary. The State of Washington concurred with the plan to use ISV for the soil cleanup.

Cleanup Plan Adjusted to Reflect New Findings

After issuing the cleanup plan, EPA negotiated with some utility companies that did business with NWT Service Company to perform pre-cleanup treatability studies. These studies included testing the effectiveness of the ISV technology, continuing ground water monitoring, and evaluating the extent of the old wooden barn's contamination.

The utilities' ISV study concluded that, while ISV would treat the soil satisfactorily, the technology was not economical and could cost as much as five times the original estimate. EPA was persuaded to amend the plan, taking into consideration the State of Washington's new hazardous waste cleanup law, the Model Toxics Control Act. Provisions of that law allow the state to impose a more stringent cleanup standard for PCBs than does federal law. Incineration would quickly and effectively destroy all contaminants to satisfy state standards but wouldn't financially jeopardize any of the waste contributors.

Fair, flexible settlements achieve results

The amended cleanup plan required off-site removal and incineration of site soil having PCB concentrations of 50 ppm or more and removal of 1,500 cubic yards of less contaminated soil and barn materials to an approved hazardous waste landfill.

Flexibility Results in Negotiated Settlements

Viewed as a partner instead of an adversary, EPA was able to secure two major cost settlements, the first in August 1991 with seven owners and operators who agreed to pay $460,000 in past cleanup costs. In November 1991, 85 utility companies — 70 of them

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The Trouble With PCBs

From the 1930s until 1977, polychlorinated biphenyls (PCBs) were widely used as coolants in electrical equipment, in brake and hydraulic fluids, and in the manufacture of plastics, adhesives, paints, and other industrial products.

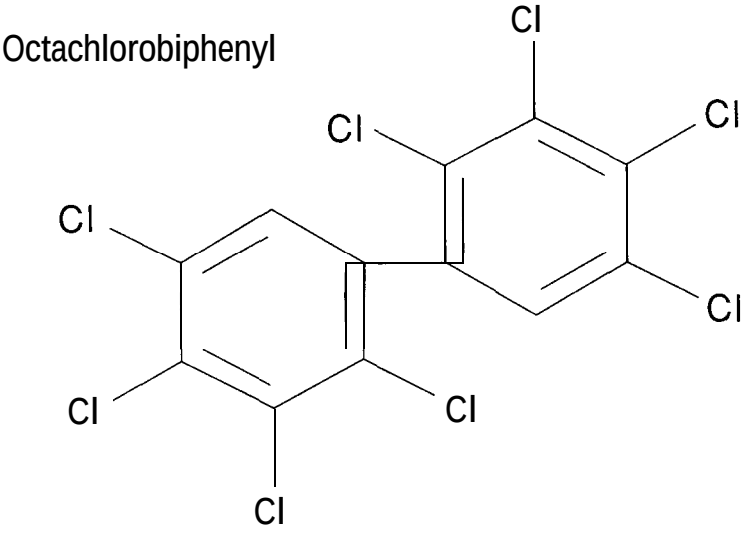
Because of their universal acceptance, PCBs were not recognized as potentially dangerous until the late 1960s. Scientific studies have shown that PCBs are unusually persistent in the environment, and background levels have been measured in outdoor air, on soil surfaces, and in water. Nearly everyone has some internal level of PCBs, including infants who drink breast milk from exposed mothers.

PCBs bioaccumulate in fatty tissue and are suspected carcinogens. For these reasons, the Toxic Substances Control Act of 1976 (TSCA) banned the manufacture, distribution, and use of PCBs.

Over the years, research on PCBs has reached some different conclusions. An industry-financed assessment concluded that the carcinogenicity of PCBs was related to the amount of chlorine used in the synthesis process, therefore EPA should adopt standards for PCBs based on chlorination.

On the other hand, studies at the State University of New York and Wayne State University link PCBs — even those that are lightly chlorinated — to neurological damage and loss of motor control, particularly in children, causing learning disabilities similar to those associated with lead poisoning. Other research at the University of Michigan found malignant breast tumors in women with higher traces of PCBs than benign tumors. Further studies of marine mammals (dolphins, seals, and whales) implicate PCBs as a cause of low birth rate and even death.

Because so many studies associate PCBs with toxicity, the EPA cleanup standard is 10 parts per million (ppm). One ppm is comparable to one drop of gasoline in the tank of a full-size car. At the Northwest Transformer site, the state standard of one ppm was applied to the cleanup of PCBs in soil.



Two hexagon-shaped molecules of carbon linked together constitute the basic biphenyl. As many as 10 chlorine atoms can be attached to the biphenyl structure, hence the name, poly (many) chlorinated bi (two) phenyl. Shown here is octachlorobiphenyl with eight chlorine atoms; there are more than 400 known compounds.

Each additional attachment of the basic biphenyl and its associated chlorines increases the molecular weight, providing greater stability. But greater stability translates into persistence in the environment and increased toxicity. Even with a manufacturing and distribution ban in effect since 1976, PCBs have bioaccumulated in species all the way up the food chain to man.

Cooperative Efforts

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de minimis (minor) generators — agreed to pay for the revised cleanup, valued at approximately $4 million. This same group agreed to reimburse $1.2 million of EPA's past costs.

Between February 1990 and November 1991, EPA and other parties signed three additional agreements for a treatability study and ground water monitoring, each valued at $500,000. Altogether, EPA recovered more than 90% of past costs and all cleanup and future monitoring costs associated with the site, a sum totalling approximately $3.7 million. Excavation and incineration began in the spring of 1993 and took one year to complete. The site now meets state and federal standards for unrestricted use.

Success at Northwest Transformer

EPA's emergency removal stabilized the NWTMP site and reduced the greatest environmental risks. When treatability studies showed the selected remedy to be expensive, EPA amended the original cleanup plan to reflect the new evidence. In the process, EPA worked closely with the State of Washington to require a stricter cleanup level for PCBs than current federal standards.

Nearly 100 responsible parties performed a long-term remediation and reimbursed EPA for past costs. Balancing different scientific and partisan perspectives resulted in a job well done that was acceptable to waste contributors and the residents of the local community. Although construction was completed in the spring of 1994, EPA will oversee monitoring of ground water at the site for at least a year.

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